

## PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference NMMP/470017WO	<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. PCT/GB2004/001556	International filing date (day/month/year) 08.04.2004	Priority date (day/month/year) 09.04.2003	
International Patent Classification (IPC) or national classification and IPC F16H15/38			
Applicant TOROTRAK (DEVELOPMENT) LTD. ET AL			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau) a total of 2 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input checked="" type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand  04.11.2004		Date of completion of this report  20.06.2005	
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer  Zevelakis, N  Telephone No. +31 70 340-4813 	

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/GB2004/001556

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**Box No. I Basis of the report**

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1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

**Description, Pages**

1-10 as originally filed

**Claims, Numbers**

1-33 as amended (together with any statement) under Art. 19 PCT

**Drawings, Sheets**

1/9-9/9 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/GB2004/001556

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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**1. Statement**

Novelty (N)	Yes: Claims	3-17,19-32
	No: Claims	1,2,18,33
Inventive step (IS)	Yes: Claims	
	No: Claims	1-33
Industrial applicability (IA)	Yes: Claims	1-33
	No: Claims	

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

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**Box No. VI Certain documents cited**

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**1. Certain published documents (Rule 70.10)**

and /or

**2. Non-written disclosures (Rule 70.9)**

**see separate sheet**

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

1 The following documents are referred to in this communication:

- D1: PATENT ABSTRACTS OF JAPAN vol. 1995, no. 07, 31 August 1995 (1995-08-31) & JP 7 091513 A (JATCO CORP), 4 April 1995 (1995-04-04)
- D2: WO 02/48578 A (TOYOTA MOTOR CO LTD ; TAKETSUNA YASUJI (JP); TAMAKI SHIGENORI (JP)) 20 June 2002 (2002-06-20)
- D3: US-A-3 810 398 (KRAUS C) 14 May 1974 (1974-05-14)
- D4: JP 08 135746 A (NIPPON SEIKO KK) 31 May 1996 (1996-05-31)

2 INDEPENDENT CLAIM 1

2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

Document D1 discloses variator of the toroidal-race rolling-traction type comprising (the references in parentheses applying to this document):

a rotatably mounted input disc(12);

an output disc(14) rotatably mounted coaxially with the input disc;

a plurality of rollers (16) transmitting rotation between the input disc and the output disc;

a plurality of actuators(4), each acting upon a respective one of the rollers;

and a plurality of levers (42), each connected to a respective one of the rollers and its associated actuator.

Note: The "plurality" of levers, rollers as well as actuators could be clearly seen from D1 and especially figure 1 where reference number "16" (as well as "10" for the total "set" of roller, lever, associated actuator) on one set of roller arrangement, clearly indicates the existence of 4 of these identical roller arrangements for the variator. Therefore, the subject matter of claims 1 and 33 is not new in the sense of Article 33(2) PCT.

**3 INDEPENDENT CLAIM 18**

- 3.1** The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 18 is not new in the sense of Article 33(2) PCT.

Document D4 discloses the subject matter of claims 18 and 33 and especially:

A variator of the toroidal-race rolling-traction type wherein each of the actuators is located radially outwardly of a common plane extending parallel to the rotational axis of the input and output discs and tangential to the periphery of the larger of the input disc and output disc. (see picture 9 of D4).

Therefore, the subject matter of claims 18 and 33 is not new in the sense of Article 33(2) PCT.

- 3.3** Additionally, based on the common knowledge of the skilled person working in this technical field, the broadly defined features of these claims (ie claims 18 and 33) could be considered to present only slight constructional changes in the location and orientation of the actuators which comes within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be foreseen. Consequently, the subject-matter of claims 18 and 33 could also lack an inventive step.

**4 DEPENDENT CLAIMS 2-17 and 19-32**

Dependent claims 2-17 and 19-32 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT).

- 4.1** The subject matter of claim 2 appears to lack novelty as it can be considered as implicitly disclosed by document D1.
- 4.2** The feature "ball joint" is described in document D1 as providing the same advantages as in the present application. It is well known that a ball joint has more than one axis of inclination and therefore all the features of claims 3-5 are hereby

considered implicitly disclosed by document D1.

Thus, the subject matter of claims 3-5 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) .

- 4.3 The features of dependent claims 6-8 have already been employed for the same purpose in similar toroidal variators for example see document D2 where a variator is disclosed which is mounted on the same plane (see D2, figures 1-3, abstract). It would therefore be obvious to the person skilled in the art, to apply these features with corresponding effect to a toroidal variator according to document D1, thereby arriving at a variator according to claims 6-8.

Therefore, the subject-matter of claims 6-8 does not involve an inventive step in the sense of Article 33(3) PCT.

- 4.4 Dependent claims 9-17 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step, the reasons being as follows:  
The features of claims 9 and 10 can be considered as merely a matter of choice from which the skilled person would select in accordance with circumstances, without the exercise of inventive skill.

The features of claims 11-17 present slight constructional changes in the design and especially the operational characteristics of the actuators, which come within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be foreseen. The claimed operational characteristics (see claims 11-17) seem also to be disclosed in D1 and D2, for example claim 13 wherein a piston is reciprocally disposed in a cylinder (see D1) or claim 15 wherein the piston is hydraulically actuated (see D1 and D2) or claim 17 wherein the actuators are double acting (see D1 and D2).

Consequently, the subject-matter of claims 9-17 does not involve an inventive step in the sense of Article 33(3) PCT, and therefore the criteria of Article 33(1) PCT are not met.

- 4.5 The additional features of claims 19-27 are identical to those of claims 9-17.  
Therefore, for claims 19-27 similar remarks as for claims 9-17 (see paragraph 4.4 of

this report) apply. Thus, the subject matter of claims 19-27 lacks an inventive step (Article 33(3) PCT).

- 4.6 The additional features of claims 28-32 are identical to those of claims 1-5. Since the subject matter of claims 1-5 is disclosed in D1, and these features have already been employed for the same purpose in a similar variator, see document D1, it would be obvious to the person skilled in the art, namely when the same result is to be achieved, to apply these features with corresponding effect to a variator like the one shown in D2, thereby arriving at a variator according to claims 28-32. Thus, the subject matter of claims 28-32 lacks an inventive step (Article 33(3) PCT).

## 5. FURTHER DEFICIENCIES

The claims are not provided with reference signs (Rule 6.2(b) PCT) and the independent claims are not provided in the two-part form (Rule 6.3(b) PCT). The application comprises two independent claims (1 and 18) which seem not to meet the requirement of unity.

### Re Item VI

#### **Certain documents cited**

##### Certain published documents

Application No Patent No	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
WO-A-2004/02793	1 April 2004	31 July 2003	17 September 2002
DE-A-102 23 425	4 December 2003	25 May 2002	

These documents might become of importance in a later (regional or national) procedure.

11 15

CLAIMS

1. A variator of the toroidal-race rolling-traction type comprising:  
a rotatably mounted input disc;  
an output disc rotatably mounted coaxially with the input disc;  
a plurality of rollers transmitting rotation between the input disc and the output disc;  
5 a plurality of actuators, each acting upon a respective one of the rollers; and  
a plurality of levers, each connected to a respective one of the rollers and its associated actuator.
2. A variator as claimed in claim 1, wherein each roller and its associated actuator is connected to a respective lever.
- 10 3. A variator as claimed in claim 1 or claim 2, comprising a plurality of levers pivotally mounted about a first axis.
4. A variator as claimed in claim 3, comprising a lever pivotally mounted about a second axis.
5. A variator as claimed in claim 4, wherein the second axis is inclined to the first axis.
- 5 6. A variator as claimed in any of the preceding claims, wherein each of the actuators is mounted to the same side of a plane aligned with and passing through the rotational axis of the variator discs.
7. A variator as claimed in claim 6, wherein each of the actuators is mounted below a  
0 horizontal plane aligned with and passing through the rotational axis of the variator discs.

14 16

26. A variator as claimed in any of claims 23 to 25, wherein the cylinders are disposed in a common cylinder block.

27. A variator as claimed in any of claims 18 to 26, wherein the actuators are double-acting.

5 28. A variator as claimed in any of claims 18 to 27, further comprising a plurality of levers, each connected to a respective one of the rollers and its associated actuator.

29. A variator as claimed in claim 28, wherein each roller and its associated actuator is connected to a respective lever.

10 30. A variator as claimed in claim 28 or claim 29, comprising a plurality of levers pivotally mounted about a first axis.

31. A variator as claimed in any of claims 28 to 30, comprising a lever pivotally mounted about a second axis.

32. A variator as claimed in claim 31, wherein the second axis is inclined to the first axis.

15 33. A variator substantially as herein described with reference to the accompanying drawings.